

REMARKS

Upon entry of the present Amendment-D, the pending claims in the application are claims 1-9 and 32-34 (claims 10-12 have been renumbered as claims 32-34), of which claims 1, 5 and 8 are independent. Claims 1, 5, 8 and 32 have been amended by the present Amendment-D.

The above-identified Office Action has been reviewed, the objections and rejections carefully considered, and the Examiner's comments carefully weighed. In view thereof, the present Amendment-D is submitted.

It is contended that by the present Amendment-D, all bases of objections and rejections set forth in the Office Action have been traversed and overcome. Accordingly, reconsideration and withdrawal of the objections and rejections is respectfully requested.

Amendments Presented

In the Claims: Claim 1 has been amended by specifying that a method of manufacturing a hollow cylindrical body includes the step of, gripping said protrusions by a gripping member; that while the protrusions are gripped in place, friction-stir-welding abutting regions of the end faces of the plate material to join the end faces to each other, thereby forming a hollow cylindrical body having said protrusions; and that said end faces of the plate material are friction-stir-welded such that said abutting region is devoid of a formation of swellings.

Claim 5 has been amended by specifying that a minimum value of displacement of said workpiece plunging member in said range is greater than 0.

Claim 8 has been amended by specifying that when said abutting regions are formed, said sags of said first end face and said second end face are disposed in confronting relation to each other and positioned on a surface of an outer circumferential wall of said curved surface; that the

burrs are positioned on a surface of an inner circumferential wall of said curved surface; and that said outer circumferential wall is longer than the inner circumferential wall.

Claims 10-12 have been amended by renumbering as claims 32-34.

Claim 32 has been amended in a manner similar to claim 5.

Applicant respectfully submits that the above amendments to the claims are fully supported by the original disclosure including drawings. Applicant also respectfully submits that no new matter is introduced into the application by amending the claims, since the entire subject matter thereof was expressly or inherently disclosed in the original claims, specification and the drawings.

Claim Objections

In the Office Action (page 2, item 1), the Examiner objected to claims 10-12 for misnumbering thereof.

Applicant's Response:

As stated above, applicant has amended claims 10-12 by renumbering them as claims 32-34, herein. Accordingly, applicant respectfully requests reconsideration and withdrawal of such objection to claims.

Claim Rejections – 35 USC §112

1. In the Office Action (page 2, item 2), the Examiner rejected claim 10 (now renumber as claim 32) under 35 USC §112, first paragraph. According to the Examiner's interpretation, the terms "plunging portions," recited in claim 32 has no basis in the specification or in the claims.

Applicant's Response:

As stated above, applicant has amended claim 32, herein. Upon careful consideration and

in light of the above amendments, applicant respectfully traverses such rejection, and submits the rejection is overcome because several paragraphs (e.g., paragraphs [031], [122], [124] and [218]) of the originally filed specification and the drawing (Fig. 13) of the present application provide express support for the method step of “plunging” portions around said end faces..., as recited in claim 10 (now renumbered as claim 32).

For example, applicant respectfully submits that paragraph [122] of the originally filed specification specifies that, “Therefore, as shown in FIG. 13, it is preferable that the central axis L1 of the probe 104 be displaced from the boundary line L2 between the end faces 1, 2 of the first protrusion 8 toward the advancing side. That is, the probe 104 is plunged into the abutting regions at a position displaced to the advancing side”.

Applicant respectfully suggests that MPEP §2163 specifies that “while there is no *in haec verba* [in the exact words] requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure”; and “the fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed. See, e.g., *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d at 1563-64, 19 USPQ2d at 1117”.

Accordingly, contrary to the Examiner’s interpretation, applicant respectfully submits that the subject matter of claim 32 was described in the specification (as originally filed) in such a way so as to reasonably convey to a person of ordinary skill in the art; and that claim 32 complies with the written description requirement, as specified in the 35 USC §112, first paragraph.

For all of the foregoing reasons applicant respectfully requests reconsideration and withdrawal of the rejection of claim 32 under 35 USC §112, first paragraph.

2. In the Office Action (page 2, item 4), the Examiner rejected claim 10 (now renumbered as claim 32) under 35 USC §112, second paragraph. The Examiner alleges that meaning of the terms “plunging portions” is not clear.

Applicant’s Response:

As stated above, applicant has amended claim 32, herein. Upon careful consideration and in light of the above amendment, applicant respectfully traverses such rejection and submits that the rejection is overcome.

Specifically, claim 32 has been amended by specifying that the step of said friction-stir-welding comprises a method step of plunging portions of the plate material around said end faces thereof along the abutment therebetween with a workpiece plunging member having a substantially circular cross section.

For all of the foregoing reasons, applicant respectfully requests reconsideration and withdrawal of the rejection of claim 32 under 35 USC §112, second paragraph.

Claim Rejections – 35 USC §102

In the Office Action (page 3, item 6), the Examiner rejected claims 5-7, and 11 (now renumbered as claim 33) under 35 USC §102(b) as anticipated by Colligan et al. (US 5,794,835) (hereinafter “Colligan”).

Applicant’s Response:

As stated above, applicant has amended claim 5, herein. Upon careful consideration and in light of the above amendments, applicant respectfully traverses such rejection and submits that the rejection is overcome because Colligan fails to disclose several features of the claimed invention for substantially the same reasons as discussed at pages 7-9 of Amendment-C of

January 16, 2009.

Specifically, applicant notes that Colligan fails to disclose a workpiece plunging member being displaced from a boundary line between a first end face and a second end face to a second end within a range less than or equal to the radius of the workpiece plunging member, as required by independent claim 5.

Regarding the Examiner's Response to Arguments outlined in the Office Action (page 7, item 5), and particularly regarding her interpretation that, "Colligan teaches the pin traveling along the joint line, being displaced from the boundary by less than the radius of the workpiece plunging member", although the Examiner's such interpretation appears to be somewhat (only mathematically) plausible, applicant notes that Colligan fails to teach the range of displacement of the workpiece plunging member from the boundary line to the second end face being equal to or smaller than the radius of the workpiece plunging member.

Rather, the pin of Colligan is operated along a joint line formed between the workpieces, and is not displaced towards either a first end face or a second end face from the joint line. Accordingly, Colligan fails to disclose the workpiece plunging member being operated within a specified range, which is equal to or smaller than the radius of the workpiece plunging member, from the boundary line between the first end face and the second end face.

Further, Colligan fails to disclose features of dependent claims 6-7 and 33 for the reasons provided in relation to claim 5, and additional reasons including those discussed below.

For example, in relation to claim 6, in contrast to the Examiner's allegation (citing Fig. 5C of Colligan), according to Colligan's second method of friction stir welding, as illustrated in his Figs. 5A-5C, a probe 18 of the non-consumable member is pressed against and inserted between plates 1A, 1B, but does not extend completely through the thickness of the materials being joined.

Therefore, Colligan fails to disclose the workpiece plunging member being displaced from the boundary line to the second end by a distance equal to or smaller than one-half of the radius of the workpiece plunging member, as recited in claim 6.

Moreover, in an effort to expedite the prosecution of the present application and to further define the claimed invention over the disclosure of Colligan, applicant has amended claim 5 herein, specifically by specifying that a minimum value of displacement of said workpiece plunging member in said range is greater than 0.

Applicant respectfully submits that such amendments to claim 5 further define the claimed invention over the Colligan disclosure (and/or the references of record) because as discussed earlier, the pin of Colligan is operated along a joint line formed between the workpieces, i.e., the pin of Colligan is at a displacement of 0. Accordingly, applicant submits that Colligan fails to teach a minimum value of displacement of said workpiece plunging member in said range is greater than 0, as required by amended claim 5.

For all of the foregoing reasons, applicant respectfully requests reconsideration and withdrawal of the rejection of claims 5-7 and 33 under 35 USC §102(b).

Claim Rejections – 35 USC §103

1. In the Office Action (page 4, item 2), the Examiner rejected claims 1-3, and 10 (now renumbered as claim 32) under 35 USC §103(a) as being unpatentable over Colligan in view of Cleveland et al. (US 2002/0020164) (hereinafter “Cleveland”).

Applicant’s Response:

As stated above, applicant has amended claims 1 and 32, herein. Upon careful consideration and in light of the above amendments, applicant respectfully traverses such

rejection and submits that the rejection is overcome, because the applied references, whether considered singly or in combination, fail to disclose several required features of the claimed method of manufacturing a hollow cylindrical body for substantially the same reasons as discussed at pages 10-12 of Amendment-C of January 19, 2009.

Further, applicant respectfully disagrees with the Examiner's allegation that it would have obvious to a person of ordinary skill in the art to grip protrusions during friction-stir-welding because none of the applied references teach gripping the protrusions. More significantly, Cleveland's tubular body does not include any protrusions projecting along the joining direction of the end faces.

Further, the applied references considered either singly or in combination fail to disclose features of dependent claims 2-3 and 32 for the reasons provided in relation to claim 1.

Moreover, in an effort to expedite the prosecution of the present application and to further define the claimed invention over the applied references, as stated above, applicant has amended independent claim 1 herein. Specifically, claim 1 has been amended by specifying that end faces of the plate material are friction-stir-welded such that said abutting region is devoid of a formation of swellings.

Applicant respectfully submits that features of amended claim 1 are not taught or suggested in the references of record, considered singly or in combination.

For all of the foregoing reasons, applicant respectfully requests reconsideration and withdrawal rejection of claims 1-3 and 32 under 35 USC §103(a).

2. In the Office Action (page 6, item 3), the Examiner rejected claim 4 under 35 USC §103(a) as being unpatentable over Colligan in view of Cleveland and further in view of Lawrence (WO 99/33594) (herein after "Lawrence").

Applicant's Response:

Upon careful consideration and review of the applied references, applicant respectfully traverses such rejection for the reasons discussed above in relation to claim 1, and further because the deficiencies of Colligan and/or Cleveland are not overcome by any additional teachings of Lawrence.

For all of the foregoing reasons, applicant respectfully requests reconsideration and withdrawal rejection of claim 4 under 35 USC §103(a).

3. In the Office Action (page 6, item 4), the Examiner rejected claims 8, 9 and 12 (now renumbered as claim 34) under 35 USC §103(a) as being unpatentable over Urschel (US 2,148,714) (hereinafter "Urschel") in view of Colligan.

Applicant's Response:

As stated above, applicant has amended claim 8, herein. Upon careful consideration and in light of the above amendments, applicant respectfully traverses such rejection for substantially the same reasons as discussed at pages 13-16 of Amendment-C filed on January 19, 2009, and submit that the rejection is overcome.

Specifically, the applied references, considered either singly or in combination thereof, fail to disclose required method steps of the claimed invention, i.e., gripping the protrusions and friction-stir-welding abutting regions of the end faces of the plate material to join the end faces to each other. Also, the applied references fail to disclose features of the burrs and sags.

Moreover, in an effort to expedite the prosecution of the present application and to further define the claimed friction stir welding process over the applied references, applicant has amended claim 8 herein. Specifically, claim 8 has been amended by specifying that when the abutting regions

are formed, the sags of the first end face and the second end face are disposed in confronting relation to each other and positioned on a surface of an outer circumferential wall of the curved surface, that the burrs are positioned on a surface of an inner circumferential wall of the curved surface; and that the outer circumferential wall is longer than the inner circumferential wall.

Applicant respectfully submits that features of amended claim 8 are not taught or suggested in the references of record, considered either singly or in combination.

For all of the foregoing reasons, applicant respectfully requests reconsideration and withdrawal of rejection of claim 8, 9 and 34 under 35 USC §103(a).

Conclusion

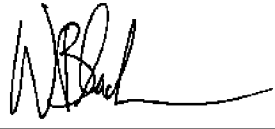
In conclusion, based on all of the foregoing, applicant respectfully submits that all of the objections and rejections set forth in the Office Action are overcome, and that as presently amended, all of the pending claims are believed to be allowable over all of the references of record, whether considered singly or in combination. Applicant requests reconsideration and withdrawal of the rejection of record, and allowance of the pending claims.

Entry of the present Amendment-D is respectfully requested under 37 CFR §1.116 on the grounds that: the amendment does not raise any new issues for consideration by the Examiner, but instead, rather further defines the claimed invention over the applied references. Therefore, the present amendment is believed to place the application in condition for allowance.

If the Examiner is not fully convinced of the allowability of all of the claims now in the application, applicant respectfully requests that the Examiner telephonically contact applicant's undersigned representative to expeditiously resolve prosecution of the application.

Favorable reconsideration is respectfully requested.

Respectfully submitted,


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June 4, 2009

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